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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,695	02/12/2004	Xinyu Dou	CS22632RL	5715
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MOTOROLA INC 600 NORTH US HIGHWAY 45 W4 - 39Q LIBERTYVILLE, IL 60048-5343			EXAMINER TRAN, CON P	
			ART UNIT 2615	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/777,695	Applicant(s) DOU, XINYU	
	Examiner CON P. TRAN	Art Unit 2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

The "SUMMARY OF THE INVENTION" section missing; and
in page 8, line 18, element "The second D/A 312" should be - - The
second D/A 318 - -.

Appropriate correction is required.

Claim Objections

2. Claim 5 is objected to because of the following informalities:

Claim 5 recites the limitations "the first analog to digital converter" in lines 15-16. There is insufficient antecedent basis for this limitation in the claim. It is also noted that there is no "second analog to digital converter" being claimed in this set of claims.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 5 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. Claim 5 recites “apply the cancellation filtered drive signal to the first analog to digital converter” and the information for the limitations could not be found in the specification. This important information must be disclosed and included in the drawings to allow one of ordinary skill make or use the claimed invention.

Actually, it appears to the examiner that the element “the first analog to digital converter” should be “the first digital to analog converter”. Therefore, the following Office Action is based on such interpretation.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. **Claims 1-3, and 8-9** are rejected under 35 U.S.C. 102(a) as being anticipated by Lechner European Patent Application EP 1383298.

Regarding **claim 1**, Lechner teaches a portable communication device (see Figs. 1, 3a, 3b, 7a, 7b, and respective portions of the specification; [0010-0014]; [0022-0023]), comprising:

- an earpiece speaker (1, Fig. 3a, 3b; [0022, 0028]);

- a loudspeaker (1, Fig. 3a, 3b; [0022, 0028]);

- a circuit (including 4, 5, 6, 7, 8, 9; see Figs. 3a, 3b) coupled to the earpiece speaker (1), and the loudspeaker (2; [0022, 0023, 0028]), said circuit comprising:

- a signal source (AF-signal of voice band electronic circuit 4, Figs. 3a, 3b, [0028]) for generating a signal for driving the loudspeaker (2), wherein said signal source is coupled to the loudspeaker (2; [0029, 0030]); and

- a cancellation filter (including frequency filter 5, phase shifting 6, adding means 9, Figs. 3a, 3b), wherein said signal source (AF 4) is further coupled to the earpiece speaker (1) through a cancellation filter ([0013, 0030, 0043]).

Lechner thus teaches all the claimed limitations.

Regarding **claim 2**, Lechner teaches the portable communication device according to claim 1 further comprising: a common acoustic resonator (shared use of big cavity, [0005]) coupled to the earpiece speaker (1, Fig. 3a, 3b), and to the loudspeaker (2, Fig. 3a, 3b; [0028]).

Regarding **claim 3**, Lechner teaches the portable communication device according to claim 1 wherein: the cancellation filter comprises a digital filter [0017]).

Regarding **claim 8**, this claim merely reflects the method to the apparatus claim of claim 1 and is therefore rejected for the same reasons. It is noted that a level of sound emanating from the loudspeaker, and coupled to a user's ear is reduced ([0001], col. 5, lines 16-29; see also Abstract).

Regarding **claim 9**, Lechner teaches the method according to claim 8 further comprising: prior to applying the drive signal to the loudspeaker, delaying the drive signal (phase shifting, [0043]) .

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claims 4-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lechner European Patent Application EP 1383298 in view of Williams U.S. Patent 4,965,822.

Regarding **claim 4**, Lechner further teaches the portable communication device according to claim 3. Lechner teaches at least one of the function units filter and phase shifter is a digital filter [0017]. However, Lechner does not specify wherein: the circuit comprises a processor; the signal source comprises a software implemented signal source; and the cancellation filter comprises a software implemented digital filter.

Williams discloses a speakerphone comprises signal processor (22, Fig. 2); the signal source comprises a software implemented signal source (FIFO delay buffer 70, Fig. 2; ; col. 5, lines 11-20; digital computer program performs all of the signal processing operations; col. 6, lines 6-9); and the cancellation filter comprises a software implemented digital filter digitizes input signal (echo canceling adaptive Finite Impulse Response "FIR" digital filter 126, Fig. 2; col. 6, lines 34-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the signal processor taught by Williams with the portable communication device of Lechner to obtain the predictable claimed limitations since the claimed invention is merely a combination of old elements, and in the combination each element merely would have performed the same function as it did separately. The motivation is to have significantly improved characteristics for voice communications, as suggested by Williams in column 3, lines 19-21.

Regarding **claim 5**, Lechner teaches a portable communication device (see Figs. 1, 3a, 3b, 7a, 7b, and respective portions of the specification; [0010-0014]; [0022-0023]), comprising:

- an earpiece speaker (1, Fig. 3a, 3b;[0022, 0028]);

- a loudspeaker (1, Fig. 3a, 3b;[0022, 0028]);

- an acoustic resonator (shared use of big cavity, [0005]) acoustically coupled to the earpiece speaker (1, Fig. 3a, 3b), and to the loudspeaker (2, Fig. 3a, 3b);

- a first amplifier (i.e., driving circuit) drivingly coupled to the earpiece speaker (driving circuit for earpiece 1, see [0028], col. 6, lines -14-17; [0030], col. 6, lines 26-30);

- a second amplifier (i.e., driving circuit) drivingly coupled to the loudspeaker (one or both of the driving circuits for the speakers, see [0030], see col. 6, lines 34-39, i.e., a second driving circuit for loudspeaker 2);

- apply a cancellation filter to the drive signal to obtained a cancellation filtered drive signal; and apply the cancellation filtered drive signal to earpiece speaker (generate a cancellation component of the sound signal produced with the earpiece speaker 1, [0038]; the phases, gains and filter characteristics of both output lines are hereby adjusted such that the cancellation component of the sound pressure wave generated on the earpiece transducer 1 is suited to cancel the hazardous sound signal originating from the hands-free transducer 2 at least partially, see Fig. 6; [0043]).

However, Lechner does not explicitly disclose:

- a first digital to analog converter drivingly coupled to the first amplifier;

a second digital to analog converter drivingly coupled to the second amplifier;

a processor coupled to the first digital to analog converter, and coupled to the second digital to analog converter wherein the processor is programmed to:

apply a loudspeaker drive signal to the second digital to analog converter;

apply a cancellation filter to the drive signal to obtained a cancellation filtered drive signal; and

apply the cancellation filtered drive signal to a first digital to analog converter.

Williams discloses a speakerphone comprises signal processor (22, Fig. 2) including a pair of digital to analog converters (DAC 84, 104, Fig. 2); the DAC 84 coupled to speaker (32, see Figs. 1, 2) via amplifier 36 (see Fig. 1); the signal source comprises a software implemented signal source (FIFO delay buffer 70, Fig. 2; ; col. 5, lines 11-20; digital computer program performs all of the signal processing operations; col. 6, lines 6-9); the cancellation filter comprises a software implemented digital filter digitizes input signal (echo canceling adaptive Finite Impulse Response "FIR" digital filter 126, Fig. 2; col. 6, lines 34-42); and apply the cancellation filtered drive signal (output 68 of summing junction 66, Fig. 2) to digital to analog converter (DAC 84, Fig. 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the digital to analog converters; and the signal

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processor taught by Williams with the portable communication device of Lechner to obtain the predictable claimed limitations since the claimed invention is merely a combination of old elements, and in the combination each element merely would have performed the same function as it did separately. The motivation is to have significantly improved characteristics for voice communications, as suggested by Williams in column 3, lines 19-21.

Regarding **claim 6**, Lechner in view of Williams teaches a portable communication device according to claim 5. Williams, as modified, further teaches wherein: in applying the cancellation filter to the drive signal, the processor is programmed to apply a finite impulse response filter to the drive signal (echo canceling adaptive Finite Impulse Response "FIR" digital filter 126, Fig. 2; col. 6, lines 34-42).

Regarding **claim 7**, Lechner in view of Williams teaches a portable communication device according to claim 5. Williams, as modified, further teaches wherein: the acoustic resonator comprises an opening for coupling acoustic energy from the earpiece speaker to a user's ear ([0024, col. 5, lines 16-29).

8. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over Lechner European Patent Application EP 1383298 in view of Andersen U.S. Patent 6,728,386.

Regarding **claim 10**, Lechner teaches the method according to claim 8. Lechner further teaches wherein cancellation filtering comprises, filtering with a cancellation filter (including frequency filter 5, phase shifting 6, adding means 9, Figs. 3a, 3b) that is characterized by a first frequency response that [0043], when compounded with a second frequency response that characterizes electrical to acoustic transducing response of the earpiece speaker (1, Fig. 3a, 3b;[0022, 0028]), substantially negates (i.e., cancels) a third frequency response that characterizes electrical to acoustic transducing response of the loudspeaker (2, Figs. 3a, 3b, [0028]. [0043]).

However, Lechner does not explicitly disclose the frequency response that characterizes electrical to acoustic as measured with an ear simulator.

Andersen discloses an electroacoustic communications unit such as a mobile telephone and a telephone handset in which using an ear simulator for measurements (col. 1, lines 37-49; col. 3, lines 20-38).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated ear simulator taught by Andersen with the portable communication device of Lechner to obtain the frequency response that characterizes electrical to acoustic transducing response of the loudspeaker as measured with an ear simulator as claimed for purpose of ensuring reproducible measurements, as suggested by Andersen in column 1, lines 42-45.

9. **Claim 11** is rejected under 35 U.S.C. 103(a) as being unpatentable over Lechner European Patent Application EP 1383298 in view of Andersen U.S. Patent 6,728,386, and further in view of Williams U.S. Patent 4,965,822.

Regarding **claim 11**, Lechner in view of Andersen teaches the method according to claim 10.

However, Lechner does not explicitly disclose wherein: cancellation filtering comprises digitally filtering with a finite impulse response filter.

Williams discloses a speakerphone comprises signal processor (22, Fig. 2) including the cancellation filter comprising an echo canceling adaptive Finite Impulse Response "FIR" digital filter 126, Fig. 2; col. 6, lines 34-42.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the cancellation filter taught by Williams with the portable communication device of Lechner in view of Andersen to obtain the cancellation filter comprising digitally filtering with a finite impulse response filter as claimed for purpose of having significantly improved characteristics for voice communications, as suggested by Williams in column 3, lines 19-21.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Con P. Tran whose telephone number is (571) 272-7532. The examiner can normally be reached on M - F (8:30 AM - 5:00 PM).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Vivian C. Chin can be reached on (571) 272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cpt
March 18, 2008

/Vivian Chin/

Supervisory Patent Examiner, Art Unit 2615